



Exploring methods for combining altimetry with other data to extend the 20-year altimetric record onto a 50 year timescale

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TITLE: Exploring methods for combining altimetry with other data to extend the 20-year altimetric record onto a 50 year timescale

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ABSTRACT BODY: Ocean satellite altimetry has provided global sets of sea level data for the last two decades, allowing determination of spatial patterns in global sea level. For reconstructions going back further than this period, tide gauge data can be used as a proxy for the model. We examine different methods of combining satellite altimetry and tide gauge data using optimal weighting of tide gauge data, linear regression and EOFs, including automatic quality checks of the tide gauge time series.

We attempt to test the sensibility of reconstruction using known and existing datasets and to test the importance of augmenting the model using various proxies such as climate indices like the NAO and PDO. We will also investigate alternative transformations such as maximum autocorrelation factors (MAF), which better take into account the spatio-temporal structure of the variation. Whereas a traditional EOF analysis tries to explain as much variance as possible, the MAF transform considers noise to be uncorrelated with a spatially or temporally shifted version of itself, unlike the desired signal which will exhibit autocorrelation. For the application to global dataset it is necessary to consider and account for wrap-around of spatial shifts. Parameters from physical oceanography will be incorporated using ocean models (i.e., DRAKKAR; SODA) for a preliminary reference. Our focus is on a timescale going back approximately 50 years, allowing reasonable global availability of model and tide gauge data. This allows for better sensitivity analysis with respect to spatial distribution, and tide gauge data.

KEYWORDS: [1641] GLOBAL CHANGE / Sea level change, [1637] GLOBAL CHANGE / Regional climate change.

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